- ★ Green Device Available
- ★ Super Low Gate Charge
- ★ Excellent CdV/dt effect decline
- ★ Advanced high cell density Trench technology
- ★ 100% EAS Guaranteed

Product Summary

RoHS

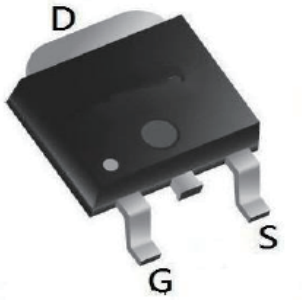
BVDSS	RDSON	ID
30V	4.8mΩ	80A

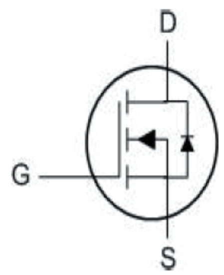
Description

The 80N03 is the high cell density trenched N-ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications.

The 80N03 meet the RoHS and Green Product, requirement 100% EAS guaranteed with full function reliability approved.

TO252 Pin Configuration





Absolute Maximum Ratings

Symbol	Parameter	Rating		Units
		10s	Steady State	
V_{DS}	Drain-Source Voltage	30		V
V_{GS}	Gate-Source Voltage	±20		V
I_D@T_C=25°C	Continuous Drain Current, V_{GS} @ 10V[1]	80		A
I_D@T_C=100°C	Continuous Drain Current, V_{GS} @ 10V[1]	50		A
I_D@T_A=25°C	Continuous Drain Current, V_{GS} @ 10V[1]	30	19	A
I_D@T_A=70°C	Continuous Drain Current, V_{GS} @ 10V[1]	25	16	A
I_{DM}	Pulsed Drain Current[2]	192		A
E_{AS}	Single Pulse Avalanche Energy[3]	144.7		mJ
I_{AS}	Avalanche Current	53.8		A
P_D@T_C=25°C	Total Power Dissipation[4]	62.5		W
P_D@T_A=25°C	Total Power Dissipation[4]	6		W
T_{STG}	Storage Temperature Range	-55 to 175		℃
T_J	Operating Junction Temperature Range	-55 to 175		℃

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{θJA}$	Thermal Resistance Junction-Ambient [1]	---	62	℃/W
$R_{θJA}$	Thermal Resistance Junction-Ambient [1] (t ≤10s)	---	25	℃/W
$R_{θJC}$	Thermal Resistance Junction-Case[1]	---	2. 4	℃/W

Electrical Characteristics (T_J =25 °C unless otherwise specified)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	30	---	---	V
△BV_{DSS}/△T_J	BVDSS Temperature Coefficient	Reference to 25℃ ,	---	0.0213	---	V/℃
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=10V , I_D=30A	---	4.8	6	mΩ
		V_{GS}=4.5V , I_D=15A	---	7.8	9	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	1	1.5	2.5	V
△$V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	-5.73	---	mV/℃
I_{DSS}	Drain-Source Leakage Current	V_{DS}=24V , V_{GS}=0V ,	---	---	1	uA
		V_{DS}=24V , V_{GS}=0V ,	---	---	5	
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
gfs	Forward Transconductance	V_{DS}=5V , I_D=30A	---	26.5	---	S
R_g	Gate Resistance	V_{DS}=0V , V_{GS}=0V ,	---	1.4	2.8	W
Q_g	Total Gate Charge (4.5V)	V_{DS}=15V , V_{GS}=4.5V , I_D=15A	---	31.6	---	nC
Q_{gs}	Gate-Source Charge		---	8.6	---	
Q_{gd}	Gate-Drain Charge		---	11.7	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=15V , V_{GS}=10V , R_G=3.3Ω I_D=15A	---	9	---	ns
T_r	Rise Time		---	19	---	
$T_{d(off)}$	Turn-Off Delay Time		---	58	---	
T_f	Fall Time		---	15.2	---	
C_{iss}	Input Capacitance	V_{DS}=15V , V_{GS}=0V , f=1MHz	---	3075	4000	pF
C_{oss}	Output Capacitance		---	400	530	
C_{rss}	Reverse Transfer Capacitance		---	315	---	

Absolute Maximum Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current[1,5]	V_G=V_D=0V , Force Current	---	---	80	A
I_{SM}	Pulsed Source Current[2,5]		---	---	132	A
V_{SD}	Diode Forward Voltage[2]	V_{GS}=0V , I_S=1A , T_J=25℃	---	---	1	V
t_{rr}	Reverse Recovery Time	IF=30A , dI/dt=100A/μs ,TJ=25℃	---	18	---	nS
Q_{rr}	Reverse Recovery Charge		---	8	---	nC

Note :
1.The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper.
2.The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%
3.The EAS data shows Max. rating . The test condition is V_{DD}=25V,V_{GS}=10V,L=0.1mH,I_{AS}=53.8A
4.The power dissipation is limited by 175°C junction temperature
5.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation

Typical Electrical and Thermal Characteristics (Curves)

Figure1:Typical Output Characteristics

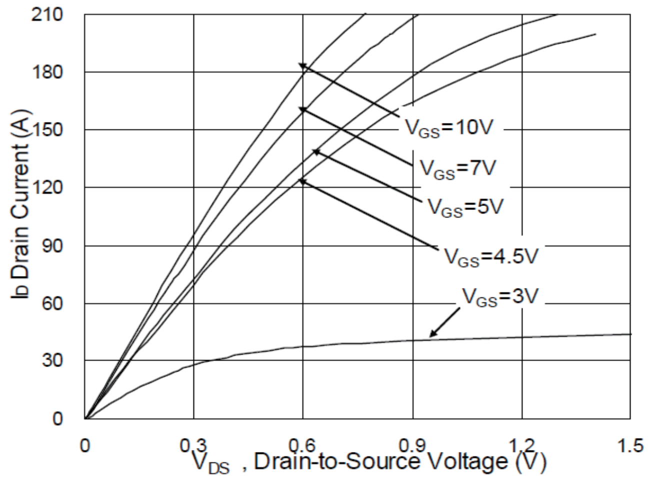


Figure 2: On-Resistance vs. G-S Voltage

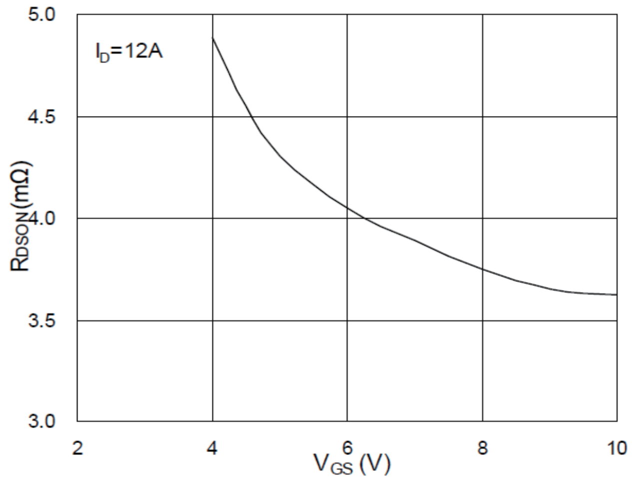


Figure 3:Forward Characteristics of Rever

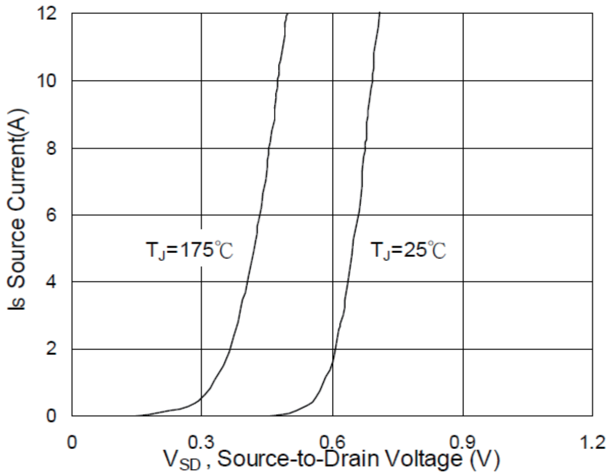


Figure 4: Gate-Charge Characteristics

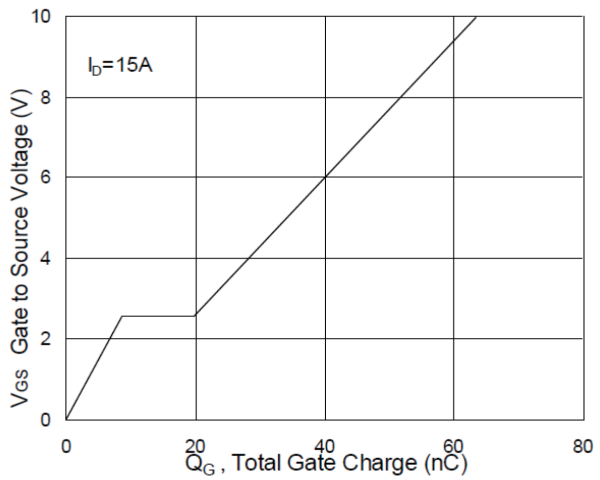


Figure 5: Normalized VGS(th) vs. TJ

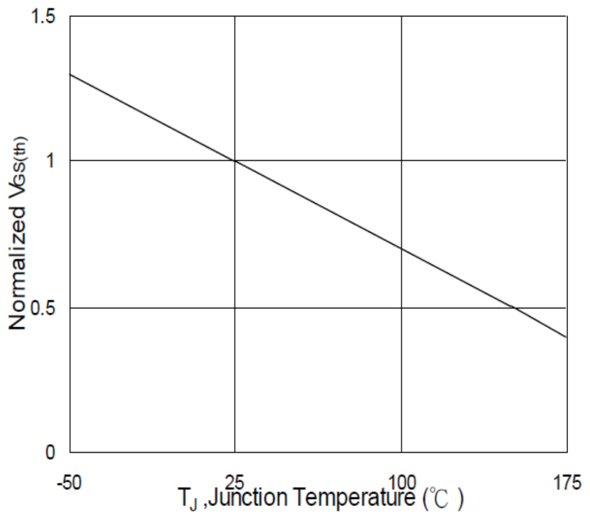
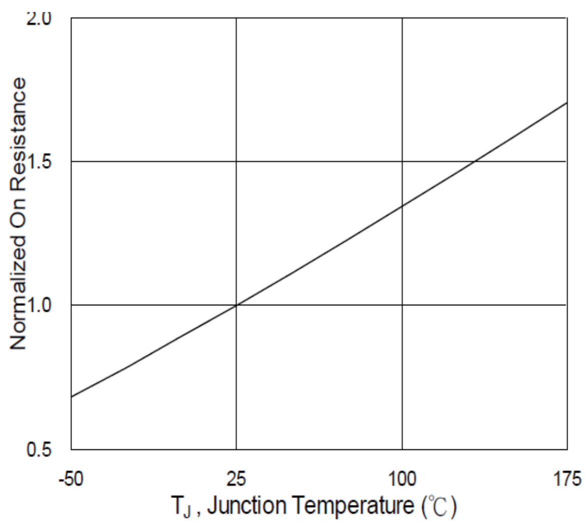


Figure 6: Source- Drain Diode Forward



Typical Performance Characteristics

Figure 7:Capacitance

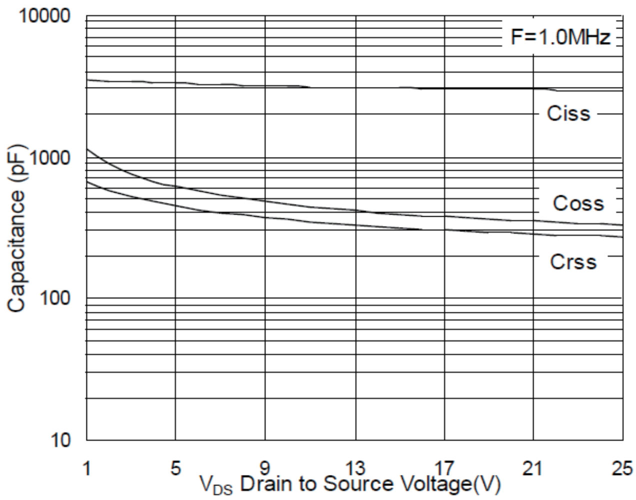


Figure 8: Safe Operating Area

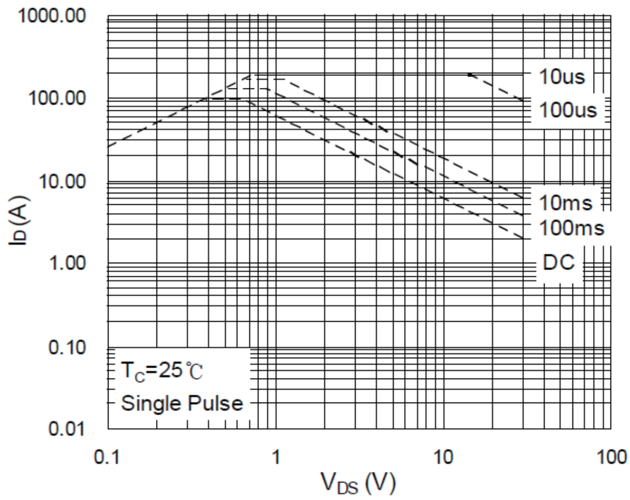


Figure 9: Normalized Maximum Transient

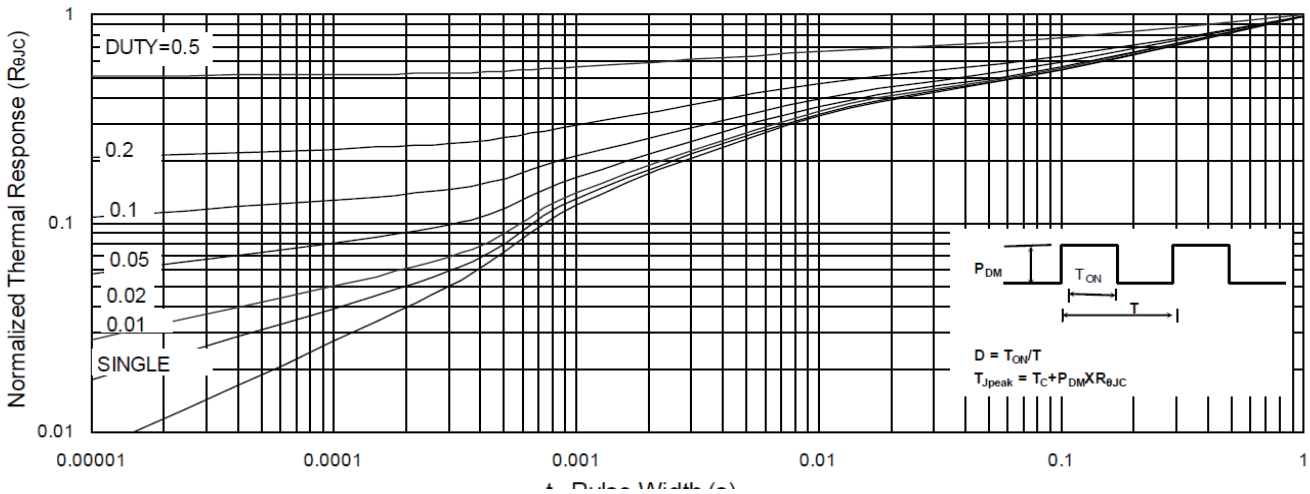
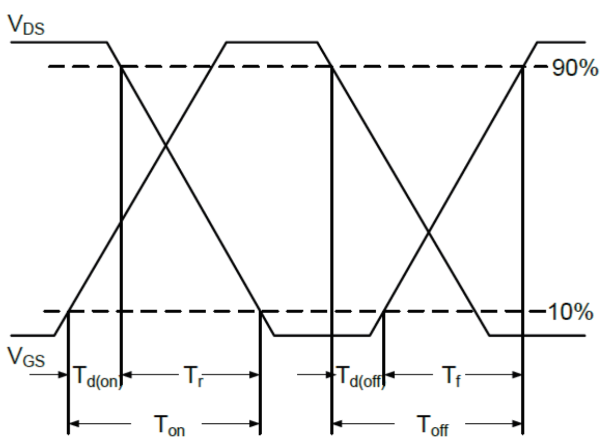
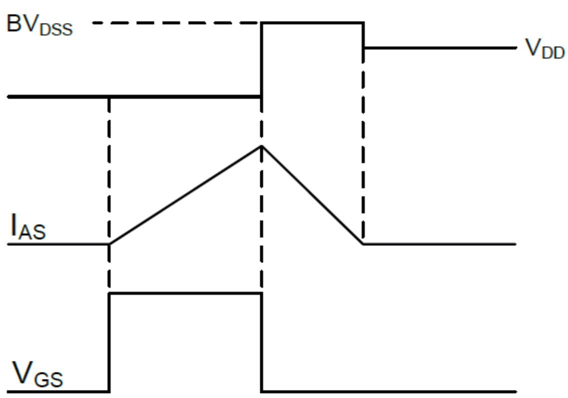


Figure.10: Switching Time Waveform

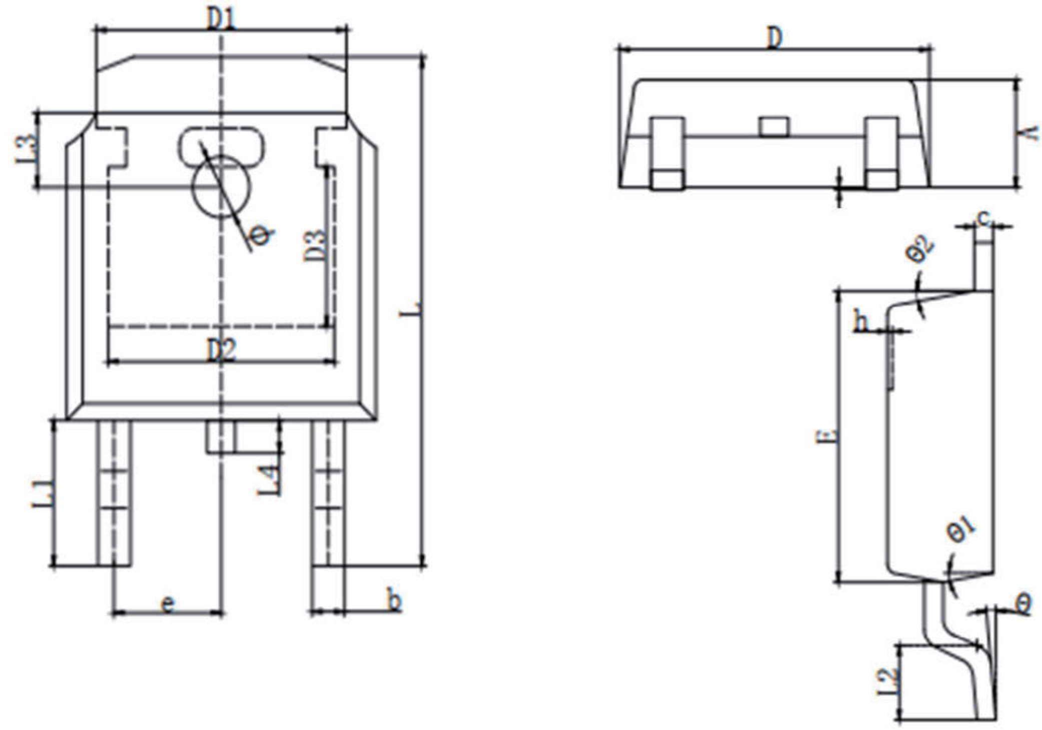


FFigure 11: Unclamped Inductive Switchi

$$EAS = \frac{1}{2} L \times I_{AS}^2 \times \frac{BV_{DSS}}{BV_{DSS} - V_{DD}}$$



TO-252 Package outline



Symbol	MILLMETER		Symbol	MILLMETER	
	MIN	MAX		MIN	MAX
A	2. 200	2. 400	h	0. 000	0. 200
A1	0. 000	0. 127	L	9. 900	10. 30
b	0. 640	0. 740	L1	2. 888REF	
c	0. 460	0. 580	L2	1. 400	1. 700
D	6. 500	6. 700	L3	1. 600REF	
D1	5. 334REF		L4	0. 600	1. 000
D2	4. 826REF		∅	1. 100	1. 300
D3	3. 166REF		θ	0°	8°
E	6. 00	6. 200	θ_1	9° TYP2	
e	2. 286TYP		θ_2	9° TYP	